REMARKS

Claims 1-12 are pending in this application. Claims 1, 3 and 4 have been amended.

Claims 1, 2, 4, and 5 were rejected under 35 USC §102(e) as being anticipated by U.S. Patent No. 6,102,520 ("Terasawa"). Claims 3, 6-8 were rejected under 35 USC §103(a) as being unpatentable over Terasawa in view of U.S. Patent No. 6,312,102 ("Moriyama"). Claim 9 was rejected under 35 USC §103(a) as being unpatentable over Terasawa in view of Moriyama and further in view of U.S. Patent No. 6,466,332 to Fukasawa. Claim 9 was rejected under 35 USC §103(a) as being unpatentable over Terasawa in view of Moriyama and further in view of Fukasawa. Claims 10-12 were rejected under 35 USC §103(a) as being unpatentable over Terasawa in view of Fukasawa.

Independent Claim 1, as amended, claims a method for improving black pixel print quality in an ink color printer having at least one color ink and black ink, comprising: selecting a fast print mode, wherein fast print mode is accomplished by increasing droplet spacing to reduce the number of rows and columns that must be marked thereby increasing print speed and printing no more than two droplets at a single location; determining a location on a substrate where a black pixel is to be printed, printing a single droplet of color ink at the location, and printing a single droplet of black ink on top of the color droplet at the same location, wherein the droplet of color ink and the droplet of black ink are of substantially the same size, forming a single black pixel having increased density of substantially the same size as each of the black and color droplets at the location when the two droplets solidify.

Independent Claim 4, as amended, claims a method for improving black print quality in an ink color printer having at least one color ink and black ink, comprising: selecting a fast print mode, wherein draft mode is accomplished by increasing droplet spacing to reduce the number of rows and columns that must be marked thereby increasing print speed and printing no more than two droplets at a single location; providing an image to be printed on a substrate; determining locations within the image where black pixels are to be printed; for each location where a block pixel is to be printed: printing a single droplet of color ink at the location, and

printing a single droplet of black ink on top of the color droplet at the same location, wherein the droplet of color ink and the droplet of black ink are of substantially the same size, forming a single black pixel having increased density of substantially the same size as each of the black and color droplets at the location when the two droplets solidify.

1. Applicants' method is concerned with improving single black pixel quality in fast print mode.

In Applicants' method, fast print mode is accomplished by increasing droplet spacing to reduce the number of rows and columns that must be marked thereby increasing print speed and printing no more than two droplets at a single location. In Applicants' method, a single droplet of black ink and a single droplet of color ink deposited at the same location forms a single black pixel at the location when the two droplets solidify.

In contrast, Terasawa's method focuses on improved black density and spread on the print media. When Terasawa prints a black drop on a color drop, either there is color showing between the black (as shown in Fig. 15), or the pixels merge and form a larger, two dot pixel (see Fig. 16).

2. Terasawa increases black ink density with either black dots having a larger volume or by printing two black dots superposed on one another. Applicants' method increases black pixel density by printing a single black droplet on top of a single color droplet.

Terasawa is concerned with the problem of printing black ink on recording material having a low ink absorption rate. According to Terasawa, a conventional recording apparatus has been designed to match a coated sheet having a relatively high spread rate and that when an ink droplet is printed on a material with low ink absorption rate, the spread rate is too small, therefore the density of the black print decreases (col. 1, lines 62-67).

Terasawa states at col. 6, lines 58-63: "In the black stressing mode, the recording apparatus provides a color superposing or double shots, as shown in Fig. 5B in the mixed color record and in the black character, respectively, whereas it provides one shot for each picture element, as shown in Fig. 5A, in the monochromatic color (Y, M or C)." It is believed that in

Terasawa a double shot of black is two droplets of black ink superposed on one another. Terasawa states at col. 7, line 1-4: "It is preferable that the volume of the black ink for the black character per one shot is larger than the total volume of the ink for the mixed color record per one shot." Terasawa further states at col. 7, lines 38-41: "wherein the black stressing mode operation is carried out so that the double shots are carried out for black characters or the like."

3. Terasawa teaches printing a color dot between adjacent black dots. Applicants' method prints a black droplet on top of a color droplet forming a single black pixel of substantially the same size as each of the black and color droplets.

The only place where Terasawa discussed printing color dots to enhance black is in Terasawa's third embodiment in which "a color ink dot such as cyan or magenta dot is provided between adjacent black dots, by which the black image density is increased by one scanning operation. See col. 3, lines 62-64. See also col. 11, lines 40-45: "as shown in Fig. 15, cyan or magenta ink droplet (broken line) is shot at a position ½ dot deviated from the black ink droplet (solid lines). Therefore, as shown in Fig. 15(6), the small spaces (white) between adjacent black ink dots are filled with cyan or magenta ink droplets, substantially completely, so that the spaces disappear."

4. Nothing in Moriyama overcomes the lack of teaching of Terasawa. Moriyama teaches forming black either by printing with black ink or forming black by printing a combination of C, M, andY.

"Whether or not a color image is present adjacent to a black image is discriminated. Whether the black image is formed using a black ink or a plurality of color inks, C, M, and Y is determined in accordance with the discrimination result. When the black image is formed using the plurality of color inks, it is recorded using a repetitive pattern of two C, M and Y so as to prevent blurring with the color image, and to improve fixing characteristics by decreasing the total ejection amount." See Moriyama, Abstract.

5. Nothing in Fukasawa overcomes the lack of teaching in Terasawa. Fukasawa teaches a black color generation amount in black printing based on a predetermined relationship with

respect to the gray component in the plurality of element colors upon performing black printing in the color space for printing comprising the plurality of approximately equivalent colors. See col. 2, lines 3-6. In the black color amount determining method, the gray component is decided based upon an undercolor amount which is a common minimum component in the plurality of element colors. See col. 2, lines 29-32.

No additional fee is believed to be required for this amendment; however, the undersigned Xerox Corporation attorney hereby authorizes the charging of any necessary fees, other than the issue fee, to Xerox Corporation Deposit Account No. 24-0025.

Reconsideration of this application and allowance thereof are earnestly solicited. In the event the Examiner considers a personal contact advantageous to the disposition of this case, the Examiner is requested to call the undersigned Attorney for Applicants, Jeannette Walder.

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Xerox Corporation
Santa Ana, California
Date: December 23, 2005